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LVII.—COLONIAL FRUIT—(continued).

DOMINICA.

The following interesting and valuable Report on the fruits of Dominica has been prepared by Dr. H. A. Alford Nicholls, F.L.S., Government Medical Officer, and a valued correspondent of Kew:—

From the time of its settlement Dominica has been justly celebrated for its fruit. Of all the British Possessions in the Lesser Antilles it is now regarded as having the best promise of the development of a large and remunerative fruit trade, not only with the United States and Canada, but also with Europe. The islands lying between Dominica and the mainland of North America, with the exception perhaps of the small colony of Montserrat, are not adapted for the cultivation of most of the tropical and sub-tropical fruits, by reason of the droughts to which they are sometimes subject. Thus it happens that Dominica is the nearest fruit-producing island of the Lesser Antilles to the United States and Canada, and it is also the nearest of the West Indian fruit

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islands to Great Britain. This is an important fact in regard to the future of the fruit trade between Great Britain and North America and the Lesser Antilles, for with so perishable an article as fruit even a few hours curtailment of an ocean voyage means sometimes all the difference between profit and loss. Possessing a fertile soil, unsurpassed in any other part of the world, an abundant rainfall, and a wide diversity of climate, owing to the mountainous nature of the country, the capabilities of Dominica for the culture of tropical and sub-tropical fruits can scarcely be over-estimated. There can, therefore, be no doubt that when the natural advantages of the island become more widely known the necessary capital will be found to form farms for the growth of the various fruits and vegetables that can be exported at a profit.

The earliest recorded instance of a trade in Dominica fruits is found in Atwood's history of the island, published in London in 1791. Atwood says, "The Lemon and the Lime Trees bear also very aromatic scented blossoms, and the fruit of both is in great abundance, large, and of excellent quality. Of these, the latter especially, great quantities are often sent in barrels to England and America. The neighbouring English islands are likewise often supplied with them from this country, especially those of Antigua and Barbados." What the old historian of Dominica wrote nearly a century ago is true even now, for quantities of the island fruit are exported not only to England and America but also to many of the neighbouring islands. It was not, however, until recent years that fruit became a regular article of export from the Colony, for the successful prosecution of such an industry requires experience in what is styled "the handling" of the fruit, experience also in the various systems of packing, and a knowledge of the requirements of the markets abroad. In past times American schooners used to come to Roseau, the chief port of Dominica, for Oranges, but owing to ignorance of the buyers and sellers the ventures did not pay; and it is scarcely to be wondered at, as the Oranges were knocked off the trees, and the bruised fruit was shipped roughly in bulk in the hold of the vessel, with the result that most of it became rotten long before its port of destination was reached. As a case in point it may be mentioned that the Blue Books show that in the year 1851 the fruit exports from the island are estimated at 703*l.*, which sum includes 115*l.*, the value of the Lime juice exported that year. With the exception of 1,019,800 Oranges shipped to the United States, and valued at 489*l.*, there are no details given of the kinds of fruit exported; and as no more Oranges were shipped to America until many years afterwards, it must be assumed that the venture was not a paying one. About 14 years ago, with a view of demonstrating the capabilities of the island for a fruit trade, I made a few trial shipments of Oranges and Shadocks to Messrs. Keeling and Hunt, of Monument Yard, London. Notwithstanding the long voyage by the Royal Mail steamers, longer in point of time than it is now, and the transshipments at Barbados and St. Thomas, the fruit, which was carefully selected and packed, arrived in London in excellent condition, and fetched the highest price in the market, where it was then somewhat scarce, and as a consequence the results of the shipments showed a large profit on the outlay. I showed several of our local merchants the account sales, but nothing was done to prosecute the trade, and things went on in their usual style, for Oranges appear in the official lists of exports for the years 1876 and 1877, and they then disappear again, as might be expected, for the shipments could not possibly have paid owing to the rough handling of the fruit. Probably there would have been no considerable fruit trade

in Dominica now but for the enterprise of some Americans who came to the island in the proper season, bought up Oranges and other kinds of fruit, and shipped them to the New York market. These Americans went the right way to work. They refused to purchase Oranges that did not have the stalks attached and properly cut, and in this way they ensured, to a great extent, the proper hand-picking of the fruit. They rejected with ridicule all bruised fruit, and what they bought they packed carefully in suitable boxes, each Orange having been examined for bruises, and if found sound wrapped in paper specially imported for the purpose. The result was a revolution in the desultory and insignificant fruit trade of the island. The Americans came back year after year, thereby showing the people that the trade was successful, and then local men began to take up the matter, with the result that at the present time the Americans have to compete with resident shippers.

With the exception of the Limes, which are extensively grown in the island for the sake of their juice, and the Bananas, which are cultivated by the peasants, the greater part of the fruit shipped from the island is gathered from trees that have grown up, in most cases accidentally, in gardens, in odd corners of estates, and by the roadside. Considering that the exports of fruit, excluding Lime juice and other fruit products, now reach in value a good deal over 1,000*l.* a year, or about one forty-eighth of the total value of the exports of the island these facts are very striking, and they are pregnant with promise for the future of the trade. Some of the planters and peasant proprietors are now turning their attention to the systematic cultivation of Oranges, Shaddocks, and other fruit trees on a small scale, but the only estates in the island devoted entirely to fruit culture are those belonging to the Lime planters, who do not, however, ship the fruit in its natural condition in any considerable quantity.

The chief fruits exported from the island are Oranges, Coco-nuts, Bananas, Limes (both fresh and pickled in brine), Mangoes, Shaddocks, and Pine Apples. The Tamarind is exported in a preserved state, but it is only when the prices are high in the home market that local shippers consider it worth their while to ship this article, and thus the quantity exported varies considerably year by year. The juice of the Lime (both fresh and concentrated) has become a very important export from the island, and any account of the fruit trade would be incomplete without some details of the industry, which was started in Dominica years ago by the late Dr. Imray, to whom the island owes, on that account alone, an everlasting debt of gratitude. The Lime, which is the fruit of a tree closely allied to the Orange and Lemon, has done much to help to revive the prosperity of Dominica; and, as the industry is constantly growing, it gives promise of great things in the future. In addition to the juice of the fruit, a very fragrant essential oil, called commercially the "essential oil of limes," is obtained from the rind of the fruit. This oil is not yet very well known in the trade, but the demand for it is increasing, and the exports of the article are accordingly running up in value. Besides Lime juice, other fruit juice has been exported by one of the planters during the last two years. The principal kind is that obtained from the Pine Apple. It is shipped principally to the United States, and it is used for flavouring purposes.

In order to give a correct idea of the fruit industry in Dominica, I have made a careful examination of the Blue Books kept at Government Office, but as the volume for 1880 is lost, and as no other copy exists in the island, I have been unable to go back for more than seven consecutive years.

**VALUE of FRUIT and its PRODUCTS EXPORTED from DOMINICA during
the Seven Years ended 1887.**

Year.	Fruit.	Tamarinds.	Raw Lime Juice.	Concen- trated Lime Juice.	Orange and Pine Apple Juice.	Essential Oil of Limes.	Totals.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1881	164 11 0	386 0 0	41 17 6	6,386 2 0	7 6 0	160 17 6	7,146 14 0
1882	625 0 8	123 0 0	20 14 0	5,081 0 10	—	168 12 0	6,018 7 6
1883	1,523 3 6*	187 0 0	21 18 4	4,597 18 4	—	176 14 0	6,507 4 2
1884	1,807 16 6*	1 0 0	31 3 0	3,234 15 10	—	284 0 0	5,358 15 4
1885	1,027 0 7*	242 3 1	514 18 0	2,737 5 10	—	90 12 0	4,611 19 6
1886	1,220 19 9	193 0 0	415 6 6	4,588 15 0	5 7 0	192 15 0	6,616 3 3
1887	1,157 15 7	32 16 0	512 7 6	7,458 18 0	19 13 0	589 16 0	9,771 6 1
Totals	7,526 7 7	1,165 9 1	1,558 4 10	34,034 15 10	32 6 0	1,663 6 6	46,030 9 10

* In the official returns for these three years fresh fruit and vegetables are included under one head.

As will be seen from this table, the total value of the exports of fruit and fruit products for the seven years amounts to the sum of 46,030*l.* 9*s.* 10*d.* Since it has not been possible, for the reasons given, to obtain any statistics for the year 1880, I have drawn up the following table showing the value of the same articles exported during the seven years ended 1879, and a comparison of the two tables will conclusively show the satisfactory progress made in the prosecution of the fruit industry notwithstanding the many disadvantages that the shippers and growers have had to contend with.

**VALUE of FRUIT and its PRODUCTS EXPORTED from DOMINICA during
the Seven Years ended 1879.**

Year.	Fruit.	Tamarinds.	Raw Lime Juice.	Concen- trated Lime Juice.	Orange and Pine Apple Juice.	Orange Peel.	Essential Oil of Limes.	Totals.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1873	38 16 7	173 8 0	783 3 8*	—	1 0 0	—	996 8 3	
1874	25 5 0	252 16 6	1,600 16 8*	6 10 0	0 4 0	—	1,885 12 2	
1875	106 19 2	168 10 0	132 15 0	1,690 18 6	—	17 10 0	2,116 12 8	
1876	107 9 11	148 1 0	135 2 4	1,699 3 4	4 0 0	0 3 6	2,121 0 1	
1877	234 0 0	219 14 0	36 0 0	1,557 10 0	—	—	2,127 4 0	
1878	72 18 4	297 1 0	187 7 0	2,079 12 0	0 5 0	199 0 0	2,992 3 4	
1879	2 0 0	486 6 0	76 5 6	3,078 12 0	10 0 0	16 5 0	3,769 8 6	
Totals	587 9 0	1,745 16 6	13,057 6 0	20 15 0	234 2 6	363 0 0	16,008	

* It was not until 1875 that any distinction was made in the official list of exports between raw and concentrated Lime juice. Both are included under the head "Lime juice."

Until the year 1886 the various kinds of fruit exported from the island were not enumerated in the official returns; but, except in the

case of Coco-nuts, were all included under the headings "fresh fruit" or "fresh fruit and vegetables." I pointed out, however, in 1886 to Mr. U. Murrain, the Chief Clerk in the Treasury Department, the advantage for statistical purposes in keeping proper records of the progress of a new and growing industry, and since then that gentleman has entered the fruit exports in detail in the Blue Books. Thus I have been able to compile the following interesting table, which shows the kinds of fruit exported during the last two years, their estimated value, and the countries to which they have been exported. (*See next page.*)

This table shows that a considerable trade in fruit is carried on between Dominica and the neighbouring islands—English, French, and Danish, more especially those lying between Dominica and the United States. Indeed as far as the northern Islands are concerned Dominica may fitly be described as their orchard. The commencement of a trade, too, has been made with the United Kingdom; and, as I understand that the fruit shipped to London was, in most instances, sold at a profit, it is to be hoped that there is here the germ of a regular trade between the mother country and this fine but neglected island. As will be noticed from the table, nearly half of the total exports goes to the United States, the Quebec Steamship Company and their officers having done all in their power to facilitate and to foster the trade, and I would here remark that it is to be regretted that the Royal Mail Steamship Company are not equally anxious to foster this local industry.

Particulars of the fruit exports are given in the table under nine heads, but two of them, namely, Limes and Pickled Limes, are essentially the same, the latter being simply ripe Limes packed in brine, which preserves them remarkably well for a long time.

The following are the average prices from which the values have been officially estimated :—

	s.	d.
Bananas, per bunch -	0	6
Coco-nuts, per barrel -	8	4
Fresh Limes, per barrel -	7	6
Pickled Limes, per barrel -	8	4
Mangoes, per hundred -	1	0
Oranges, per hundred -	1	0
Pine Apples, per barrel -	8	4
Shaddocks, per barrel -	8	4
Non-enumerated fruits, per barrel -	5	0

It must be remembered, however, that this valuation is for fruit properly pickled, selected, and packed ready for export, and it includes the cost of packages and packing. In bulk the fruit can be bought much cheaper. Thus, selected and hand-picked Oranges can be purchased at 9*d.* a hundred, and Limes at 4*s.* a barrel, and it would doubtless pay some London fruiterer to visit Dominica in the fruit season in order to buy up fruit for export.

Under the head of "non-enumerated fruits" are included a great number of various kinds other than those mentioned in the eight foregoing columns of the table. Perhaps, for its size, Dominica produces a larger and more varied number of fruits than any other part of the tropics. I have made the following list of 60 kinds of fruit that are grown in the island; and in order to make the list as useful as possible, I have given the local names, the botanical names, and the habitat of the plants producing the fruits, as well as the season during which each kind is plentiful, and I have added such special information as appeared to me to be necessary. Each plant has been placed under its natural order, as such a classification is perhaps the easiest for reference.

TABLE showing the VALUE of the different kinds of FRUIT EXPORTED from DOMINICA during the Years 1886-87, and the Countries to which the Fruit was Exported.

Names of Countries.	Oranges.	Coco-nuts.	Bananas.	Limes.	Limes Pickled.	Mangoes.	Shaddocks.	Pine Apples.	Unenumerated Fruits.	Total Value.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
United States -	867 17 5	33 15 0	10 1 0	76 10 0	74 11 8	—	48 4 7	1 5 0	4 14 2	1,116 18 10
Antigua -	6 9 6	270 15 2	136 17 6	—	—	19 11 8	—	—	9 12 6	443 6 4
Guadeloupe -	—	117 11 8	18 4 0	—	—	—	—	1 5 0	0 12 6	197 13 2
St. Kitts -	13 15 0	125 19 4	30 4 0	2 12 6	—	0 8 4	—	—	—	172 19 2
St. Croix -	3 10 0	30 6 11	102 0 6	—	—	9 7 6	—	2 1 4	1 5 0	148 11 3
United Kingdom -	49 11 8	—	0 6 0	9 15 0	8 15 0	—	3 6 8	1 16 8	7 19 2	81 10 2
Barbados -	12 18 0	3 14 0	2 0 6	3 7 6	—	2 10 0	—	2 8 0	26 1 8	52 19 8
St. Thomas -	5 3 0	18 15 0	69 15 0	—	—	18 6 8	—	—	1 0 10	113 0 6
St. Martin's -	17 1 6	7 12 9	7 10 0	—	—	—	—	—	0 8 4	32 12 7
St. Bartholomew -	—	4 3 4	1 17 6	—	—	—	—	—	—	6 0 10
British North America -	5 0 0	—	—	—	—	—	—	—	—	5 0 0
Grenada -	—	—	3 9 6	—	—	—	—	—	—	3 9 6
Martinique -	—	—	—	2 12 6	—	—	—	—	1 4 2	3 16 8
Montserrat -	—	0 16 8	—	—	—	—	—	—	—	0 16 8
Totals -	981 6 1	673 9 10	382 5 6	94 17 6	83 6 8	50 4 2	51 11 3	8 16 0	52 18 4	2,378 15 4

ANONACEÆ.

1. **Sour Sop** (*Anona muricata*).—Habitat, West Indies. Season, May to October, but it may be obtained in small quantities during the greater part of the year. It is a large fruit with a hard green skin and a soft pulp of a pleasant acid flavour. The pulp, which is white, is sometimes mixed with sugar and water, and it then makes a delicious drink during hot weather. The fruit is quite common in the island, the tree bearing it growing wild in many places.

2. **Custard Apple** (*Anona reticulata*).—Habitat, West Indies. Season, October to February. This fine fruit occurs abundantly, and like the Sour Sop it grows wild in many places. It has a sweetish pulp of a pleasant flavour, which is also sometimes made into "Custard Apple drink."

3. **Sugar Apple** (*Anona squamosa*).—Habitat, West Indies. Season, June to August. This fruit is abundant, and its pleasant sweet pulp is much esteemed. Were fruit steamers with cold chambers to run between the Antilles and London, Sugar Apples, Sour Sops, and Custard Apples could easily be delivered in good condition at the home markets, where they would doubtless meet with a ready sale.

MALVACEÆ.

4. **Sorrel** (*Hibiscus Sabdariffa*).—Habitat, North Africa. Season, November to January. This fruit, the produce of an annual, is common in the island. It makes an excellent jam, and it is used for tarts, pies, &c. A very pleasant beverage, called "Sorrel drink" is also made from it in the following manner: The Sorrel capsules, with a little spice to taste, are boiled with water until they become pulpy. The next day the pulp is strained out, and the resulting clear fluid is sweetened with sugar, bottled off, and allowed to remain until slight fermentation sets up, when it is ready for use.

GUTTIFERÆ.

5. **Mammee Apple** (*Mammea americana*).—Habitat, West Indies. Seasons, March to May and August to December. Occurs in abundance, and is exported in small quantities to the neighbouring islands and to America. The fruit has a thick leathery rind, and four large seeds which are covered with a dense pulp having somewhat the flavour of an Apricot. In fact the fruit is called "Zabricot" by the natives.

MALPIGHIACEÆ.

6. **Barbados Cherry** (*Malpighia punicifolia*).—Habitat, West Indies. Season, May to September. The tree bearing this fruit is very common in the island. The "Cherries" are used extensively for making jams, and they are also candied with sugar. The fruit could be exported only in cold chambers.

7. **Surinam Cherry** (*Malpighia glabra*).—Habitat, South America. Season, April to July. This fruit is not grown to any extent in the island, for as it has somewhat of an aromatic taste, it is not much liked except by a few persons.

AURANTIACEÆ.

8. **Citron** (*Citrus Medica*).—Habitat, India, but naturalised in the West Indies. The Citron grows well in the island, but it is not very common as the fruit is used only in small quantities for the purpose of

making the well-known candied Citron peel. Some years ago, one of our shippers exported to America a few barrels of the rind preserved in brine, and he informed me that the article sold readily at a profit, but that he gave up the venture as he could not obtain a sufficient number of the fruits. The Citron is cultivated very extensively in Corsica, where the fruit is called "Cedrat," and the industry there is a very paying one. There is no reason whatever why it should not pay equally well in Dominica, should any person be enterprising enough to "go in" for the culture.

9. **Lemon** (*Citrus Medica*, var. *Limonum*).—Habitat, East Indies, but naturalised in the West Indies. Season, June to February. This fruit is rather scarce, but it grows well in the island and can be propagated quickly. Several large varieties occur, and, although the fruit itself is too coarse to be useful for export, the rind is valuable for the purpose of making the Candied Lemon Peel of commerce. A very fragrant essential oil is also obtained from the rind.

10. **Orange** (*Citrus Aurantium*).—Habitat, East Indies, but naturalised in the West Indies. Season, September to February, but some of the trees bear much earlier than September. The Orange is almost wild in Dominica. It springs up wherever the seeds are thrown, and the seeds are often carried to odd places by birds. After the Lime, the Orange is the most important of Dominica fruits. The list of exports shows that during the years 1886-87 Oranges to the value of 981*l.* 6*s.* 1*d.* were exported from the island, and yet not one of the trees bearing this fruit was planted, it may safely be said, with a view to the export of the produce. This interesting fact is significant, and it is a clear indication of what the island is capable of doing. The trees are raised from seed, and contrary to what I have often read, I find that they "breed true." Dominica seedling Oranges, or rather the best kinds of them, cannot be surpassed anywhere for lusciousness, sweetness, and delicacy of flavour.

11. **Sweet Lime** (*Citrus Medica*, var. *Limetta*).—Habitat, East Indies. Season, June to January. This delicious Orange is much smaller than the common kind. It has a thin smooth rind and a sweet pulp. It is grown rather extensively, but most of the fruit is bought up in the island, as it is considered one of the best of the Orange family in Dominica. But for the flavour the fruit is exactly like the Lime to which it is closely allied.

12. **Tangerine Orange** (*Citrus nobilis*, var. *Tangerina*).—Season, June to January. This fine and well-known fruit is quite common in the island and could be exported in quantity.

13. **Seville Orange** (*Citrus Aurantium*).—Habitat, India, but naturalised in the West Indies. Season, June to February. The Seville Orange occurs in abundance, and it is used extensively for making marmalade. The rind is the source of the Orange-peel of the druggists and it is the aurantii cortex of the British Pharmacopœa. A valuable essential oil is also obtained from the skin by distillation, and it is sometimes exported from the island. The peel used to be shipped, but it has not been exported lately. In 1878, as will be seen on reference to the table of fruit exports, the shipments of this article were valued at 199*l.*

14. **Lime** (*Citrus Medica*, var. *acida*).—Habitat, India, naturalised in the West Indies. Season, June to February, but Limes in more or less quantity can be got in Dominica all the year round. After Sugar products and Cacao, Lime juice is now the most considerable export from Dominica. Several estates are devoted entirely to the culture of

the tree, and there are in all of them factories for the concentration of the juice which, in this form, is shipped to England and to America, and is the source of much of the citric acid manufactured there. The juice is usually concentrated from 10 or 12 to 1, when it becomes a dark stuff like in appearance to molasses. The exports of the raw or natural fruit juice are increasing, as are those of the essential oil obtained from the skin of the ripe Limes. As soon as this fruit becomes better known in England it will doubtless to a great extent replace the Lemon of Southern Europe. It is certainly a better fruit, and it contains more juice. At the time of the Colonial and Indian Exhibition, at the request of Sir Augustus Adderley, I shipped a good many of our fruits to the Exhibition market. The Limes sold at the rate of 30s. a barrel, and I am told that they sometimes fetch this price at New York. But last year I sent a small consignment as an experiment to a firm in London, and they had difficulty in disposing of it at a price which did not cover the cost.

15. **Shaddock** (*Citrus decumana*).—Habitat, India, naturalised in the West Indies. Season, October to February. This fruit occurs in abundance, and it is now regularly exported. There are several varieties of various sizes. One kind has a reddish pulp and another kind has a whitish one. Owing to the extreme thickness of the skin the fruit keeps fresh for a long time, and it bears the long voyage to Europe remarkably well.

16. **Forbidden Fruit or Pomelo** (*Citrus decumana*, var. *Paradisi*).—Habitat, India. Season, June to February. This fruit is not abundant as there is no particular demand for it; but it grows well in the island, and could be exported in large quantities.

OXALIDÆ.

17. **Carambo** (*Averrhoa Carambola*).—Habitat, Asia. Season, November to February. Introduced this fruit into the island some years ago from the Trinidad Botanic Gardens, it has taken well to the soil and climate, and it bears abundantly.

AMPELIDÆ.

18. **Grape** (*Vitis vinifera*).—Habitat, Asia. Seasons, January to March and October to December. The Grape-vine grows very well in the island, and considerable quantities of the fruit could be raised for the early markets in America and England if Messrs. Scrutton's system of carrying fruit in cold chambers of their steamers be regularly followed. In Dominica the vines can be made practically to bear at the will of the gardener, as flowers are put out after each pruning, and if the vines be not pruned they will remain sterile for long periods. A large green grape is the kind most frequently cultivated, but it has been long in the island, and the influence of soil and climate has no doubt obliterated entirely or obscured beyond recognition the characters of the original variety.

TEREBINTHACÆ.

19. **Plum** (*Spondias purpurea*).—Habitat, West Indies. Season, May to August. The finer varieties of this fruit are much liked by many persons. The tree bearing the plum is quite common, and it is easily propagated by simply cutting off a branch and planting it in the ground during wet weather, when it soon takes root. A yellow species, *Spondias lutea*, is also grown, but it is not so good a fruit as the Purple Plum.

20. **Golden Apple** or **Pomme Cythère** (*Spondias dulcis*).—Habitat, Society Islands. Season, July to September. This fruit is common in the island, and it is esteemed by the people. It could, however, be exported in cold chambers only, as it soon spoils after ripening.

21. **Mango** (*Mangifera indica*).—Habitat, East Indies, but naturalised throughout the West Indies and South America. Season, April to October. The supply of Mangoes in the island is practically unlimited, for the tree is one of the commonest in the lowlands. The people being very fond of the fruit—indeed, in the season it forms an important part of their food—they eat it whilst walking along the roads, and throw the seeds away. The seeds soon germinate, and as the seedlings are very hardy the tree springs up in all directions, and it is found by the sides of all the roads and paths. There are many varieties of the Mango in the island, the grafted kinds yielding the best and most luscious fruits. As will be seen from the table of exports large numbers of Mangoes are shipped to the neighbouring islands.

22. **Cashew** and **Cashew Nut** (*Anacardium occidentale*).—Habitat, West Indies. Season, May to September. The Cashew tree is wild in the island, and it gives practically two “fruits”—the Nut and the “Apple.” The latter is simply the large pear-shaped swollen receptacle of the Nut, called by botanists a pedicel. It has a pleasant acid astringent flavour, and is liked by many persons. It contains much juice, which in Brazil is made into an excellent wine. The nuts are roasted, in order to destroy an acrid oil which pervades them. They are shipped from the island in small quantities to the neighbouring islands and to Europe. The nut is an excellent one, and the trade might be greatly increased.

LEGUMINOSÆ.

23. **Ground Nut.** (*Arachis hypogæa*).—Habitat, West Africa. Season, April to June. This nut is cultivated in the island in small quantities only for local consumption. It grows well, bears abundantly, and the cultivation could be indefinitely extended. It is the principal export from the settlements at the Gambia, whence the nuts are shipped to Marseilles and there made into “olive oil!” A good deal of this spurious olive oil is imported into Dominica and other West Indian islands, and it would, doubtless, pay well to cultivate the nut and make the oil on the spot, and thus save half a dozen profits to the consumer.

24. **Tamarind.** (*Tamarindus indica*).—Habitat, East Indies. Season, July to September. The Tamarind occurs in great abundance in the island; and, as I have shown, it is a constant article of export in its preserved state. The fruit is too acid to be eaten raw. It is candied or preserved in syrup. The common commercial article, known as “Tamarinds” is simply the ripe fruit deprived of its shell and packed into barrels, into which afterwards molasses is run and finds its way after a time into all the interstices of the fruit.

CHRYSOBALANÆ.

25. **Zicack.** (*Chrysobalanus Icaco*).—Habitat, West Indies. Season, November to January. This fruit is wild, and the shrub bearing it grows along the sea shore, and a little way in the interior. It is not much esteemed, but many persons like the flavour. It is sometimes called “fat pork” in consequence of the likeness of the pulp to the fat of pork. It would make excellent candied fruit.

ROSACEÆ.

26. Fraisè, or Redberry. (*Rubus rosæfolius.*)—Habitat, Northern India. Seasons, April to September. This fruit, which evidently escaped from cultivation many years ago, is now wild, and occurs abundantly along the roadsides in several districts of the island. By careful cultivation it might be so improved as to make a very fine fruit; but, in its wild condition, it is too full of seeds to entitle it to take high rank. It is eaten with cream like strawberries, and is also made into jam.

27. Strawberry. (*Fragaria vesca.*)—Habitat, Europe. Season, May to July. This delicious fruit is scarce in the island, but it grows well in the mountains, and it even bears in the lowlands. The fruit is not nearly so fine as the European and American varieties, but this is probably due to the fact that no attention has been directed to the cultivation of the better kinds.

28. Loquat. (*Eriobotrya japonica.*)—Habitat, Japan. Season, April to July. The Loquat is rather rare in Dominica now, for it has been introduced into the island only within the last few years, but the tree grows well, and I have seen it springing up in several out-of-the-way places.

MYRTACEÆ.

29. Governor Plum. (*Eugenia Jambolana.*)—Habitat, East Indies. Season, July to September. This fruit has not long been introduced into the island, and it is therefore scarce now, but the trees are being propagated, as the fruit is much liked.

30. Malay Apple. (*Eugenia malaccensis.*)—Habitat, East Indies. Season, August to November. This fruit is rare in the island, but it could be grown in quantity were there any foreign demand or it.

31. Rose Apple. (*Eugenia Jambos.*)—Habitat, West Indies. Season, August to September. This fruit is common in the hills. The trees were used formerly as protective belts for coffee plantations. The fruit is a good one, the flavour being somewhat like that of rose water, and hence its name. It makes an excellent preserve.

32. Guava. (*Psidium Guava.*)—Habitat, West Indies. This is, perhaps, with the exception of the lime, the commonest fruit in Dominica. It can be obtained all the year round, but it is in greatest abundance between December and May. It is not cultivated, as it is endemic on the lowlands near the coast. Indeed the guava scrub soon takes possession of any of the lowlands left out of cultivation. Frugivorous birds are very fond of the fruit, and, as the small hard seeds are unaffected by the digestive juices, the birds are the principal agents in the distribution of the plants. There are several varieties of this guava. One called the Cayenne guava is a fine large fruit, and the commonest kinds are all very pleasant to the taste. The fruit makes excellent jams and jellies, which might be exported in considerable quantities were any person to take up the manufacture with a view to commercial profit.

33. Purple Guava. (*Guava Cattleianum.*)—Habitat, South America. Season, June to December. This fruit is smaller, but much superior in flavour to the common guava. It is not, however, abundant in the island.

34. **Pomegranate.** (*Punica Granatum*).—Habitat, North Africa. Season, April to July. This well-known fruit is common, and it grows to a large size in the island. It could easily be exported to Europe and America, but I believe that no attempt has been made to do so as yet. The rind is much used locally to make a decoction which is deservedly esteemed as a valuable remedy in chronic diarrhœa and dysentery.

COMBRETACEÆ.

35. **Almond** (*Terminalia Catappa*).—Habitat, West Indies. Season, April to June. This fruit is not much eaten, although it occurs in abundance. The flavour is not unlike that of the Filbert.

CUCURBITACEÆ.

36. **Musk Melon** (*Cucumis Melo*).—Habitat, Asia Minor. This fruit is rather rare, but it grows well in the island and could be cultivated for export in large quantities.

37. **Water Melon** (*Citrullus vulgaris*).—Habitat, North Africa. The Water Melon is not cultivated in Dominica to any extent, but it thrives well, and the vine bears abundantly.

PAPAYACEÆ.

38. **Papaw** (*Carica Papaya*).—Habitat, West Indies. Always in season. The Papaw springs up spontaneously about the cultivated lands on the coast of the island, and the fruit is abundant. It is very pleasant to the taste, and it acts as a digestive owing to the principle, papain, which it contains. The half ripe fruits on being scratched yield a milky juice, which, when dried, is the drug papayotin from which papain is obtained. Papayotin has been already exported in small quantities, and a sample was shown in the Dominica Court at the Colonial and Indian Exhibition.

PASSIFLOREÆ.

39. **Water Lemon** (*Passiflora laurifolia*).—Habitat, West Indies. Season, April to July. This fruit occurs in great abundance, and the vine bearing it is both wild and cultivated. The fruit lasts very well, and it might be shipped even now to the New York market were ordinary care taken in the packing. It has a very pleasant sub-acid flavour, and it is a general favourite.

40. **Granadilla** (*Passiflora quadrangularis*).—Habitat, West Indies. Season, April to July. This fruit is quite common in the island, but as it does not last long, it could be exported only in vessels with cold chambers.

CACTEÆ.

41. **Prickly Pear** (*Opuntia Tuna* and *Cereus*, various species).—Habitat, West Indies. Season, October to December. The prickly Pear is obtained from several genera of Cactææ, and the fruit of all resemble each other. Should a considerable fruit trade be developed, Prickly Pears will doubtless become articles of export.

42. **Barbados Gooseberry** (*Peirescia aculeata*).—Habitat, West Indies. This fruit is rare, the scandent leafy shrub bearing it grows luxuriantly. It makes an excellent jam.

RUBIACEÆ.

43. **Genip** (*Melicocca bijuga*).—Habitat, West Indies. Season, August to October. This fruit is not common, and it is not liked by many persons. It has a leathery rind, and a large hard seed which is surrounded by a thin layer of sweetish pulp. It remains fresh for a long time, and could be easily exported if there were a demand for it.

SAPOTÆÆ.

44. **Star Apple** (*Chrysophyllum Cainito*).—Habitat, West Indies. Season, June to August. This fine fruit is rare in Dominica, but it grows well in the island. If it could be introduced into the American and English markets it would, I believe, meet with a ready sale.

45. **Boni or Damson Plum** (*Chrysophyllum oliviforme*).—Habitat, West Indies. Season, July to September. The fruit, which is the produce of a large and handsome tree, is sparingly grown.

46. **Sapodilla** (*Sapota Achras*).—Habitat, West Indies. Season, October to January. This fruit is much esteemed, and it is abundant during the season. It is usually picked from the tree in a half ripe condition and allowed to ripen in the house, as the frugivorous bats are very fond of it, and they make sad havoc amongst the ripe fruit. Messrs. Scrutton, Sons, and Co., having succeeded in getting this soft and easily spoiled fruit from Demerara to England in excellent condition by means of the cold chamber system, the experiment has really successfully solved the question as to whether the more perishable of the tropical fruits can be placed in the London markets in a fresh state. The next thing to be done is to build up a successful trade in these fruits, and, as Dominica is the nearest tropical country to England capable of supplying fruit in large quantities, it is to be hoped that the fact will be brought to the notice of those interested in the matter.

47. **Balata** (*Bumelia retusa*).—Habitat, Dominica and Jamaica. Season, July to September. This excellent fruit is not cultivated, but is the produce of one of the finest and loftiest hard wood trees of the forests which cover so large an extent of the island. It is as large as a good sized Damson, the skin is yellowish brown, and the pulp is very pleasant to the taste.

POLYGONEÆ.

48. **Seaside Grape** (*Coccoloba uvifera*).—Habitat, West Indies. Season, September and November. This fruit, as its name implies, grows close to the sea-shore. It is a pleasant fruit, and makes an excellent preserve. The fruits are sometimes steeped in rum, in the same way that Cherries are in brandy, and they give a very agreeable flavour to the spirit.

LAURINEÆ.

49. **Avocado Pear** (*Persea gratissima*).—Habitat, South America. Season, August to October. This valuable fruit is very abundant in the island, and it enters largely into the food supply of the people. If steamers with cold chambers for fruit storage were to run regularly between the island and London, the Avocado Pear and other such fruits would undoubtedly after a time become articles of considerable trade with Great Britain.

EUPHORBIACEÆ.

50. **Gooseberry** (*Cicca disticha*).—Habitat, East Indies. Season, August to November. This tree, which, by the way, Grisebach wrongly described as a shrub, is common in the island, and its fruit, which is borne very abundantly, is used principally for making jams and other preserves.

51. **Candle Nut** (*Aleurites triloba*).—Habitat, East Indies. Season, September to December. This tree is rare in the island, but it grows well and bears abundantly. It is called "Candle Nut," because the seeds contain so much oil as to burn brightly like wax candles. The fruit is liked by many persons.

URTICACEÆ.

52. **Fig** (*Ficus Carica*).—Habitat, South Europe, Asia, and North Africa. This delicious fruit is always in season, but less plentiful in the months of April, May, and June. It grows well in Dominica, and might be made of commercial value. The purple variety is the only one that is cultivated in the gardens, but it is, I believe, the best of its kind.

53. **Bread Fruit** (*Artocarpus incisa*).—Habitat, Pacific Islands. Season, November to January. The fruit of this tree is really used as a vegetable in its ripe state, and as it is much liked by the people it is cultivated extensively. It might, therefore, be exported in considerable quantities. The spikes of the male flowers are sometimes candied like the Citron and Lemon-peel, and if introduced to the trade would no doubt meet with a ready sale.

54. **Bread Nut** (*Artocarpus incisa*, var.).—Habitat, Pacific Islands. Season, November to February. The tree producing this Nut is a variety of the Bread Fruit. The so-called "Bread Nuts" are simply the seeds which are found in the interior of the large fruits that, in outward appearance, are indistinguishable from the ordinary Bread-fruits. The seeds are somewhat like chestnuts in look and flavour. They are boiled and eaten with salt, and are also used by cooks for stuffing poultry.

55. **Jack Fruit** (*Artocarpus integrifolia*).—Habitat, East Indies. Season, February to April. There are only a few trees growing in the island, and as the fruit is not cared for much by the people there are no signs of its propagation. The seeds are eaten like the Bread-nuts.

PALMEÆ.

56. **Coco-nut** (*Cocos nucifera*).—Habitat, Tropical Countries. Always in season. The Coco-nut, besides being exported in considerable quantities, enters largely into the food of the people of Dominica. The tree is very common, and there is scarcely a garden or yard in the island without one or more of these splendid palms growing therein. No particular use is made of the fibrous husk, so that this valuable article is really a waste product in Dominica. The oil is made in small quantities, and all of it is consumed locally. A "Cocal" or Coco-nut plantation near to the sea-shore, with machinery for making the oil and preparing the fibre and bristles from the husk, would no doubt be a very paying concern, and there is, therefore, room for capital and enterprise in this direction. If it pay to erect a factory in London to prepare the fibre and bristles, it ought to pay much the more in Dominica, where labour and land are cheap, where water power can

take the place of the more expensive steam-engine, and where there would be a saving in the difference between the carriage of the prepared and the raw products.

57. Date (*Phoenix dactylifera*).—Habitat, Africa and Asia. This fruit is rare in the island, but if a regular fruit trade were established it would doubtless be cultivated extensively. The Date palm grows very well in Dominica, and it appears to be quite hardy.

BROMELIACEÆ.

58. Pine Apple (*Ananas sativa*).—Habitat, West Indies. The fruit is in season from May to September, and it occurs in the greatest abundance. It is not exported to any extent, but that is simply because none of the planters have cared to "go in" for the cultivation under the present disadvantageous condition of the fruit trade. Within the last year or so, however, one of the most intelligent and enterprising of our planters has started the cultivation for the purpose of expressing the juice, which he ships to the United States at a profit. Pine Apple juice ought to be a success if introduced to the English markets during the hot season, for as a flavouring substance for ices, cooling drinks, and such like, it would be quickly bought up.

MUSACEÆ.

59, 60. Banana and Plantain (*Musa sapientum*).—Habitat, the Old and New World tropics. These fruits occur in the greatest abundance, and they are always in season. They could be exported from Dominica in practically unlimited quantities. Many varieties are grown in the island, and they are of all sizes and flavours, from the large and luscious Fig Banana to the small and delicate "Fig Sucrier." There is a very large trade in Bananas between Jamaica and the United States, and there is no reason whatever why a portion of this trade should not be diverted to Dominica. I believe that the fruit can be purchased cheaper in Dominica than in Jamaica, for the cacao cultivation is being rapidly extended in this island, and Plantain and Banana "trees" are put in for shade to the young cacao plants. Thus there is always a quantity of fruit in excess of local wants, and only a fraction of this surplus is exported to the neighbouring colonies.

Besides the above sixty fruits several others have been introduced into the island lately, and they are growing so luxuriantly as to indicate that they have found in Dominica a congenial soil and climate. Amongst these fruits, I would especially mention the following which have been introduced from the Royal Gardens, Kew.

The Mangosteen (*Garcinia Mangostana*). Hab., East Indies.

The Baobab (*Adansonia digitata*). Hab., Tropical Africa.

The Durian (*Durio Zibethinus*). Hab., Ind. Archipelago.

The Monstera (*Monstera deliciosa*). Hab., Mexico.

All of the fruits enumerated in the above list could be produced in much greater quantities than they are now if there were such a demand for them that fairly remunerative prices could be offered to the growers. Of course many of the fruits could not be exported to Europe or even to North America under the present condition of the trade. But were steam vessels, specially adapted to carry fruit and provided with cold storage chambers, to ply *regularly* between Dominica and New York and Dominica and London, all the fruits in the catalogue could be shipped in large and constantly increasing quantities.

In the development of a large fruit trade Dominica labours under peculiar disadvantages. The island is so backward that the means of communication from one part to another is of the worst possible description, and it thus happens that the fruit hitherto exported has been gathered from trees and plants growing only in the neighbourhood of Roseau and Portsmouth; the two ports of entry on the leeward side of the island. The other districts are practically untouched by the present trade, although fruit can be got from them in the greatest abundance. The roads, except for a mile or two round Riseau, the chief town, are simply bad bridle paths or goat tracks, and carriage by carts is entirely out of the question. Some years ago, with a view of opening up the coast trade, a few of the leading men in the island decided to get up a small company to start a coasting steamer. Most of the capital was readily subscribed as it was thought that the Government would guarantee an interest of 5 per cent., for the members of the Legislative Assembly and the Executive Council were all favourable to the scheme. But the Government in Antigua—which as regards facility of communication is as far away from Dominica as is Lisbon from Berlin—very injudiciously declined to sanction the small outlay for the first year or so, and the undertaking unhappily fell to the ground. The entire absence of proper means of communication from one district to another has much to do with the present backward condition of the island, and unless the country be opened up by good roads the fruit trade cannot possibly attain to anything like the large dimensions that the peculiar natural advantages of the country render it capable of reaching. But, notwithstanding this, the trade might be greatly increased even under the present adverse conditions, were the means of transit to the great markets improved, were greater care taken at the ports of destination to look after the interests of shippers, and were the Government to endeavour to foster the trade by offering subsidies to steamship companies willing to run regular fruit vessels, and by offering premiums to those planters and shippers who usually go into the trade in a serious manner. The Quebec Steamship Company do all they can to foster the trade, and they have really effected a good deal. But their ships are not specially adapted to carry fruit, and they do not arrive at the island with sufficient punctuality. In the case of Oranges it is necessary to commence the packing several days before the steamers are expected, and sometimes the vessels come into port a day or so late, in which case there is a heavy loss in the fruit. The Royal Mail Steam Packet Company do not, I believe, specially desire to develop a fruit trade with Dominica. But, still, all the fruit shipped from the island to London has hitherto gone by the Company's vessels, and it has been transhipped at Barbados, where the inter-colonial packets connect with the trans-Atlantic ones. Oranges, Limes, and Shaddocks, shipped in this way from Dominica, have arrived in London after a fortnight's voyage in excellent condition, thereby showing, beyond all doubt, that the island can easily supply the home markets with Oranges and similar fruits. The trade with London might be immediately increased if Messrs. Scrutton, Sons, and Co. could be induced to make Dominica the last port of call for their direct line steamers; but, as this would probably dislocate their arrangements, they might require a subsidy for the first year or so, or until the trade became sufficiently extensive to bear a good margin of profit.

In the opening up, however, of a trade of this sort it is to be expected that there will be frequent losses if the fruit be consigned to the open market and sold for what it will fetch; and this is really one of the greatest obstacles in the development of the industry. Our growers

and shippers of fruit are not men of capital, and, for this reason, a disastrous shipment may mean in individual instances the abandonment of further efforts in this direction. It requires for the building up of a permanent trade that the nascent industry should be nursed by experienced persons. The Dominica fruit shipped to London should be received by a firm willing to take some trouble to obtain good prices for it, until wide channels for its disposal are regularly opened up. In large and rich countries where men of capital can be found ready to embark in such undertakings, all this would be done as a matter of course, but Dominica is too poor and too backward to be able to go about the starting of new industries in such a way as to be able to guarantee success. Experience has shown that the people of the island will not embark in a new undertaking unless it be satisfactorily demonstrated to them that there is money to be made in it. And really one cannot blame them. The crisis in the sugar trade, and the backward condition of the country, has rendered local men cautious to the extreme. It follows, therefore, that a rapid increase of the fruit trade of the island cannot be expected to take place unless aid comes from abroad.

Dominica is, as I have shown, peculiarly fitted by range of climate, fertility of soil, and geographical position, to become, for its size, one of the finest and richest fruit-growing countries of the tropics. If these facts become known, men of capital in England and America may be induced to take the future of the fruit trade of the island into their own hands, and if this should happen it will be, I am satisfied, as fortunate for them as it will be for the future welfare of Dominica.

H. A. ALFORD NICHOLLS.

Mr. J. Cox Fillan, of Wall House Estate, has furnished the following information respecting the development of the fruit trade at Dominica :—

Under the head of the fruit trade of Dominica I confine myself principally to Oranges, as being the fruit in which the greatest trade is carried on, and in which I have most experience. Bananas, Pine Apples, and Limes are, to a limited extent, also exported from Dominica. There are several drawbacks to a successful development of the Orange trade. First, our fruit is sent too late to both the European and American markets, so that when it reaches those centres it has to compete with a larger quantity of Oranges than if placed there from May to August, instead of from September to December. This change of crop time could easily be effected if due regard were paid to pruning the trees at the proper time, and to other requisite modes of cultivation to obtain that end. Another drawback is the careless and almost wanton manner in which the fruit is picked, and the absence of any method in the selection or sorting of the various kinds of Oranges.

At present the majority of the Oranges sold in this market are bought by the shippers (who are not necessarily growers) from small proprietors and labourers, who have a few trees in or about their "gardens" (provision grounds) or cottages. These persons as a rule bestow no care on their trees, and are quite unconcerned whether their fruits are large or small, sour or sweet, stained or not; and if remonstrated with as to the small size of their fruit they will invariably reply in their native patois "the offspring of the same mother is not always alike and of the same size." I think the buyers and shippers of fruit could to a great extent induce the growers to remedy these drawbacks if they were to decline to buy inferior fruit, or to make such a difference

between the prices of poor and of fine fruit, that the grower would find it entirely to his interest and to his profit to be careful in the gathering and selection of the fruit he brings to market. Yet another drawback is the unsuitableness of the steamers which now carry what fruit is shipped, and the irregularity and uncertainty of the delivery of the fruit at its destination. I suppose this desideratum is one that will remedy itself so soon as the "trade" becomes sufficiently large, but it is to be regretted that the present mode of conveyance does not give the shipper and the consumer all the advantages that could be derived by a speedy transport pending the increase of the trade.

The exportation of fresh preserved fruit is yet in its infancy, and I believe has hitherto been only tried experimentally. It now awaits only capital and energy and success will be achieved.

Jams, Jellies, and Preserves.—At present the sugar used in the manufacture of these has to be imported from England and from America, weighted with a heavy freight and a still heavier import duty, and before it reaches the markets another freight has to be incurred. It will thus be seen that West India preserves cannot in any way compete with the home-made sweets of England and the United States, where sugar is cheaper than in its native land.

After all that has been written on fruit-growing, perhaps the most important step necessary to advance the economical industries of Dominica is the establishment of a botanical garden or station, under scientific and practical superintendence, where information and advice on agricultural subjects could be obtained, and economic plants supplied for sale at a moderate expense. Such an establishment, in my opinion, is absolutely indispensable, even at the cost of increased taxation.

J. COX FILLAN.

MONTSERRAT.

This small island has become the head-quarters of the Lime industry in the West Indies, chiefly through the enterprising action of the well-known Montserrat Lime Juice Company with which Mr. Joseph Sturge is connected. There were recently exported from Montserrat:—Lime Juice of the value of 10,300*l.*, Green Limes of the value of 325*l.*, Tamarinds of the value of 254*l.*, and general fruit of the value of 93*l.* The principal fruits enumerated by Mr. J. Spencer Hollings as growing at Montserrat are Java Almond (*Terminalia Catappa*), Avocado Pears, Banana, Bell Apple (*Passiflora maliformis*), Water Lemon (*P. laurifolia*), Citron, Cocconut, Custard Apple, Date, Fig, Forbidden Fruit, Genip, Granadilla, Guava, Hog Plum, Jamaica Plum (*Spondias purpurea*), Java Plum (*Eugenia Jambolana*), Jack-fruit, Lemon Lime, Mammea Sapote, Mango, Melon, Orange of several varieties, Pineapple, Plantain, Pomegranate, Pomme Rose (*Eugenia Jambos*), Sapodilla, Shaddock, Sour Sop, Star Apple, and the Tamarind. The Avocado Pear, Water Lemon, Bell Apple, Guava, Hog Plum, Lime, Mango, Mammee Sapote, Orange, Pineapple, Plantain, and the Shaddock are abundant. The Lime and Tamarinds are largely exported.

The months of June to December are the chief fruit months. At present there is so little demand that only Limes, Bananas, and Pineapples are grown for export. Of other fruits the quantities available are so small that no local wholesale price is obtainable.

Limes are exported fresh, preserved, or pickled. Lime juice is exported fresh and concentrated. Pine apples are exported fresh and candied. Bananas are exported in a fresh state.

The production of fruit could be largely extended in Montserrat if regular opportunities for shipment in suitable vessels at a low rate of freight were provided.

The fruits now imported into the Colony are the ordinary bottled and pudding fruits from the United Kingdom, and the canned and dried products of the United States. The trade in these is very limited.

ST. CHRISTOPHER AND NEVIS.

In these islands most of the tropical fruits found in the West Indies are cultivated to a small extent. At present these fruits are utilised locally, and little if any are exported. The Banana, Pine Apple, Mango, Orange, Lime, Plantain, and the Mammee Apple are fairly abundant, and easily capable of considerable extension. The Shaddock, Guava, Cocoa-nut, Granadilla, Pomegranate, are grown sparingly, and in the opinion of the Venerable Archdeacon Holme, to whom we are indebted for the above information, are not capable of being easily increased.

The preserved fruits available are Guava jelly, Guava jam, Pine Apple jam, Mammee Apple jam, Mango jam, and Tamarinds.

VIRGIN ISLANDS.

Mr. President Cameron has prepared the following information respecting the fruits of the Virgin Islands:—

In compliance with the instructions contained in the Secretary of State's Circular Despatch of the 30th November 1887, I have the honour to forward such information as I am able to give relative to the fruits of this Presidency.

The only fruit that is at all cultivated is the Banana. Of these there are three kinds, the horse and fig Banana and the Plantain. Many other fruits grow wild, such as Mangoes, Guavas, Guava berries, Custard Apples, Avocado Pears, Sour Sops, and others. Bananas and Sour Sops are obtainable all the year round. Mangoes come in about the end of May, Pears in July, and Guavas and Guava berries a little later. The greater part of what is grown is available for export, and is actually exported. The production, however, is not on a scale to permit of wholesale dealings. All the fruits above mentioned are exported in a fresh state, none in a preserved state. Their destination is St. Thomas. A fair quantity of the different kinds of Bananas are carried there, and realise from 40 to 75 cents a bunch. I am unable to give an estimate of the value of the various fruit exports; they can however, only amount in all to an insignificant sum.

Bananas might, I imagine, be grown in very much larger quantities than at present, and the islands are fairly well situated for communication with the United States. The development of a fruit trade, however, is impossible without the introduction of capital, there being no local men with either means or energy to take up such a business

whatever might be the inducement offered. Until, therefore, the Virgin Islands are redeemed from the utter isolation which renders them a *terra incognita* to all but the casual official, I fear that any resources they may possess either in this or any other line must remain undeveloped.

BERMUDA.

The following is a list of the chief fruits grown in the Bermudas:—

The Sugar Apple, common, and bearing freely; Cherimoya, becoming common; Lemon, common, but not produced in sufficient quantities for home consumption; Bitter Orange, common, bears freely; Sweet Orange, not common, many trees have ceased to bear at all, and the remainder are very irregular in so doing; Mandarin Orange, a few trees to be found; Grape Fruit, common, bears profusely; Grape, not common, most attempts to foster the growth having failed; Tamarind, not common, fruit not of much use; Strawberry, a fair amount raised for early home consumption; Quince, fairly common, but not fruiting satisfactorily; Surinam Cherry (*Eugenia uniflora*), common, and bearing freely; Guava, not very common, fruit unsatisfactory; Pomegranate, common, but fruit not of much use; Papaw (*Carica Papaya*), common, bears freely; Musk Melon and Water Melon, common, and bearing profusely in early summer; Avocado Pear, a most valuable and highly esteemed fruit, but barely most irregularly, some years in profusion and others barely at all, obtains a high price, as much as 4s. to 6s. a dozen; Banana, common, bears profusely; Lime, common, bears freely, and is much used locally; Loquat, common, bears profusely.

These fruits are obtainable as follows:—

Fruit.	Season.	Local Prices.
Strawberry	January to May	2s. per quart.
Loquat	January to March	6d.
Lemon	Perennial	1s. to 2s. per dozen.
Lime	Do.	9d. to 1s. 3d. per dozen.
Banana	Do.	2s. per lb. (by the bunch).
Sugar Apple	December to April	2s. per dozen.
Papaw	Perennial	1s.
Musk Melon	July and August	1d. per lb.
Water Melon	Do. do.	1d. "
Bitter Orange	October to December	6d. per dozen.
Sweet Orange	Do. do.	1s. 6d. to 2s. 6d. per dozen.
Pomegranate	August to November	} No trade.
Tamarind	August to December	
Guava	September to October	
Avocado Pear	July to October	4s. to 6s. per dozen.
Grape Fruit	October to December	No trade.
Cherimoya	Do. do.	6s. per dozen.
Surinam Cherry	Perennial	6d. per quart.
Quince	September to December	No trade.

None of these are available for export.

No fruits are exported at present; but Bananas (certainly), Avocado Pears, Loquats, Strawberries, and Melons (perhaps) might be produced more largely, but it is highly doubtful whether, under the general circumstances of the soil, the limited amount of cultivatable land, and the

difficulties of transport, any remunerative cultivation for export could be carried on.

Oranges, Apples, Pears, Grapes, and Water Melons are largely imported from the United States, whence also quantities of tinned preserved fruits of all kinds are obtained. During the plying of the Jamaica-Bermuda subsidized mail steamers much tropical fruit arrived from the West Indies, but since the discontinuance of this service in 1886 the trade has entirely disappeared, and the want of the fresh fruit is much felt.

There is no doubt that almost every tropical, sub-tropical, or ordinary fruit will grow in these islands, whether remuneratively or not has never been ascertained. Many attempts have been made to induce the general cultivation of fruits, but without much result. The planter is engaged in the somewhat uncertain business of raising Onions, Potatoes, Tomatoes, and Beetroots for the New York market. At times he obtains very large and profitable returns for his labours, whilst at other times he experiences a heavy loss on his year's work, and it is very difficult to start new ideas with regard to gardening. Some progress has been made in Banana and Strawberry cultivation with satisfactory results, for there is a very fair demand for them during the winter and early spring seasons, when the islands are thronged by American and Canadian visitors. In many quarters it is believed, and it has been frequently urged by those interested in the commercial welfare of the community, that much larger profits would be obtainable if the planter and gardener were to give more attention to raising produce for the local market. Large quantities of very fine Peaches were formerly raised in these islands, but of late years, in fact since 1870, the fruit has been attacked when half grown by a highly destructive insect which causes it to drop from the trees, and a perfect specimen of the ripe fruit is rarely if ever seen here. The trees are still very numerous and grow luxuriantly, and it would be a great advantage if some remedy could be discovered to counteract and prevent the ravages of the insect.

LVIII.—INDIA-RUBBER IN UPPER BURMA.

The following "Particulars regarding the India-rubber Trade in the Mogaung District of the Upper Burma Forest Circle," extracted from the monthly proceedings of the Chief Commissioner, Burma, for May 1888, have been communicated for publication in the *Bulletin* by the Secretary of State for India.

Mr. Warry, the author of the paper, is a member of the Chinese Consular Service who has been sent to Burma for work among the Chinese emigrants.

From W. Warry, Esq., Political Officer, Bhamo, to the Chief Secretary to the Chief Commissioner, Burma, Bhamo, 9th April 1888 :—

I have the honour to submit, for the information of the Chief Commissioner, some particulars regarding the India-rubber trade in the Mogaung district.

India-rubber seems to have been first exported from Upper Burma to Rangoon about the year 1870. Up to 1873 the trade was free to all who chose to engage in it; since 1873 the forests have been worked under the monopoly system. For the first nine years five Chinese

firms styled Mientsuan, Chengho, Fuhomei, Sunshenhsiang, and Paohsing, respectively, were the joint concessionaires. The two first named were Fokienese merchants who supplied the bulk of the capital, and the three last were Yunnanese who superintended the actual operations. The price received by the Burmese Government was Rs. 60,000 for the first triennial term (1873-75), Rs. 70,000 for the second (1876-78), and Rs. 90,000 for the third (1879-81). In 1882 there was a split between the members of the syndicate, the result of which was that the monopoly for that one year sold for Rs. 70,000. During the next year business in India-rubber was at a standstill owing to local disturbances caused by the "Kachin revolt." In 1884 two Yunnanese firms agreed to pay Rs. 45,000 for a three years' lease of the monopoly; and when their term expired, the lease for one year from September last was put up to auction and realised a lac of rupees.

The forest officer attached to the Mogaung column has no doubt reported on the general distribution of the *Ficus elastica* and on the Kachin methods of tapping it. I shall, therefore, touch very briefly upon these subjects. The Chinese say that the India-rubber tree occurs throughout a very extensive district stretching several hundred miles north of Mogaung and extending to the east far across the Chinese border. A fractional part only of this immense area has been worked. The largest and most regular supply of rubber seems to have been hitherto procured in forests distant from four to six days' journey north of Kamein. An equally large supply should soon, it is said, be obtained from the Endaw and Laotsun districts. On the recent expedition we met a few raft loads coming down the Endaw River, but there has, as yet, been no arrangement between the Chinese and the local tsawbw as under which the forests can be systematically worked.

The Kachins are described as exceedingly jealous of interference with their trees, and very careful in their methods of tapping them. What I myself observed on the march fully bore out the latter part of this statement. The few trees seen were strong and vigorous, and though covered with innumerable small incisions even up to the tiny topmost branches, they had obviously not been drained to the extent of one-half their power. In the early days the Kachins made the natural mistake, soon discovered and rectified, of over-bleeding the trees; it was in this way ascertained that a large tree if bled to death would yield 500 viss of rubber in the course of a single season.

Mogaung is the headquarters of the India-rubber trade. Of the total yearly supply four-fifths are brought into Mogaung by Kachins, the majority of whom are in the regular employ of the Chinese lessees, and one-fifth is purchased in the districts by Chinese Agents of the lessees. Under the present system the Chinese manager at Mogaung, a man named Li, makes liberal advances to Kachins to defray their expenses during the collecting season, which lasts from September till June. These advances are made almost indiscriminately to any one who applies for them, no security is asked or given, and it very rarely happens that this confidence in Kachin honesty is misplaced. The Kachins having brought the rubber into Mogaung sell it to Li. All payments are now made in rupees. The price obtained when I was at Mogaung averaged Rs. 145 for a 100 viss, last year it varied from Rs. 120 to Rs. 130. Formerly the Kachins used to be much cheated in the process of weighing, and they retaliated by passing off upon the purchasers India-rubber balls the centre of which consisted largely of stones and dirt. This system proving inconvenient to both parties was sometime since abandoned by mutual consent. The Kachin is now credited with the full weight or nearly the full weight of his rubber, which on its arrival

at Mogaung is well washed, dried, and minutely examined, ball by ball, before it is scaled. Those Kachins who have received advances from Li make the refund by selling to him at half the current price, until the amount of the debt is cleared off. A small quantity of rubber, as I have said, is collected by Chinese agents of the lessees. Up till quite recently there were only 10 or 12 of these agents. They travel from district to district making purchases from Kachins. The price paid is nominally the same as at Mogaung, but as the Kachins possess no standard weights they are usually cheated to the extent of about 70 per cent. This profit on the difference of weight more than pays all the expenses of the agents. In November of last year a new and hitherto unworked district was opened. Lin, one of the monopolists, arranged with an influential Chinese family named Chao (who reside at Tachiai and protect the Sima route into China), to hire some 400 Chinese and Shan coolies to work the forests in the neighbourhood of the Amber mines. Objection to this inroad was at once made by the local Kachin tsawbwas, who insisted on the right of working the forests themselves, and declined to admit other labour. After much discussion a compromise was arrived at on the following basis: Two hundred of the new coolies were to return at once, the remainder were to be allowed to collect rubber under the superintendence of the Kachins, to whom they were to pay 10 per cent. of the quantity collected. The place of the 200 dismissed coolies was to be taken by an equal number of Kachins, who were to be paid for what they collected at the rate current in other districts. Under this system matters have so far worked smoothly; it was expected at Mogaung that at least 20,000 viss of rubber would be obtained from the new forests this season.

In most cases India-rubber is subject to certain charges whilst in transit through Kachin districts other than those in which it was produced. The tsawbwas of such places usually take a very moderate toll, perhaps two or three balls out of each hundred. So long as these charges do not amount in all to more than 10 per cent. no complaint is made. But this proportion is sometimes largely exceeded; and in such cases a remonstrance, nearly always successful, is made by the Chinese to the tsawbwa or tsawbwas who have helped themselves too liberally. Posaw, the ex-Myoök of Mogaung, was of great service to the Chinese in arranging disputes of this nature between them and the Kachins; since his flight a regular expenditure in presents to the tsawbwas has become necessary in order to keep the amount of transit dues at a reasonable level. Whatever may be the poll-tax paid on India-rubber coming down to Mogaung the Chinese manager and the Kachin owner bear the loss in equal shares. The Kachin, however, is amply compensated by being housed and fed at the expense of the Chinese during his stay in Mogaung.

The circumstances of the past year have been very favourable to the India-rubber trade. New producing districts have been opened, and old districts have been better worked than before. Owing to the apprehension caused by the visit of the British troops to the Jade country, little or no work was attempted at the mines till quite late in the season, and a number of Kachins and Shans usually employed at the mines were able to offer their services to the India-rubber traders, whose operations had at first been hampered by the scarcity of labour.

The profits realised this year by the lessees must be considerable. There are no means at Bhamo for ascertaining how much India-rubber they have already sent down to Rangoon, but it is thought here that before the end of their term they will have collected at any rate, if not shipped, something over 150,000 viss. I estimate that a total collection

of only 50,000 viss would pay them a handsome dividend on their outlay. The account may be stated thus :—

PAYMENTS.		RECEIPTS.	
	Rs.		Rs.
Cost of license - - -	1,00,000	Sale of 50,000 viss at	
Cost of 50,000 viss of rubber		Rangoon at Rs. 450	2,25,000
at Mogaung, at Rs. 145 per	72,500	per 100 viss - -	
100 viss - - -			
Freight, Mogaung to Bhamo	1,000		
(say) - - -			
Freight, Bhamo to Rangoon,	3,250		
at Rs. 6 8.0 per 100 viss -			
Expenses of establishment at	12,000		
Bhamo, Mogaung, and Man-			
dalay (say) - - -			
Incidental expenses, such as	2,000		
presents to Kachin tsawbwas,			
&c. - - -			
Total - - -	1,90,750	Total - - -	2,25,000

Which leaves a clear profit of Rs. 34,250, that is to say, over 17 per cent. on the capital invested, assuming that the whole outlay occurs at the commencement of the season, which is by no means the case. But there is little doubt that the lessees will collect a great deal more than 50,000 viss this season; and on every extra 50,000 viss collected they will make a net profit of nearly a lac and a half of rupees.

From the foregoing calculation it seems clear that the public revenue derived from the India-rubber forests is far too small. It is not easy to indicate any sure plan by which it may be improved during the next year or two. It is possible, of course, that there may be keener competition when the monopoly is next put up to auction; but it is quite as likely that a "ring" will be formed to keep the price at its present low level. The difficulty is that as matters now stand the Yunnanese are the only traders who can conduct business safely and profitably with the Kachins in the Mogaung district. With the single exception of Loenpin, the Jade lessee, no native, even of another Chinese province, has yet attempted to compete with them in those regions. Indeed there are not half-a-dozen Cantonese or Fokienese, all told, at Mogaung, and these are all in partnership with natives of Yuannan, who require a larger capital than they can themselves command. The Yunnanese confess that not many even of their own traders possess the tact and patience essential to the preservation of continuous and satisfactory business relations with the Kachins. It is probable, therefore, judging from the present unfriendly attitude of the Kachins towards us that any attempt to buy rubber direct from them, or to collect it in their forests, would be a failure. The Yunnanese, from interested motives, would be averse to assisting us in the task, and without their co-operation, or at least their good-will, it would be difficult, if not impossible, to secure a regular supply. With the complete pacification of the district this difficulty will no doubt disappear; in the meantime it might be found possible, either by placing a reserve price on the monopoly when next put up to auction, or by abolishing the monopoly and taxing the India-rubber as it is brought down, or by effecting some arrangement with the Yunnanese traders, to make these fine forests yield something more than the nominal revenue heretofore derived from them.